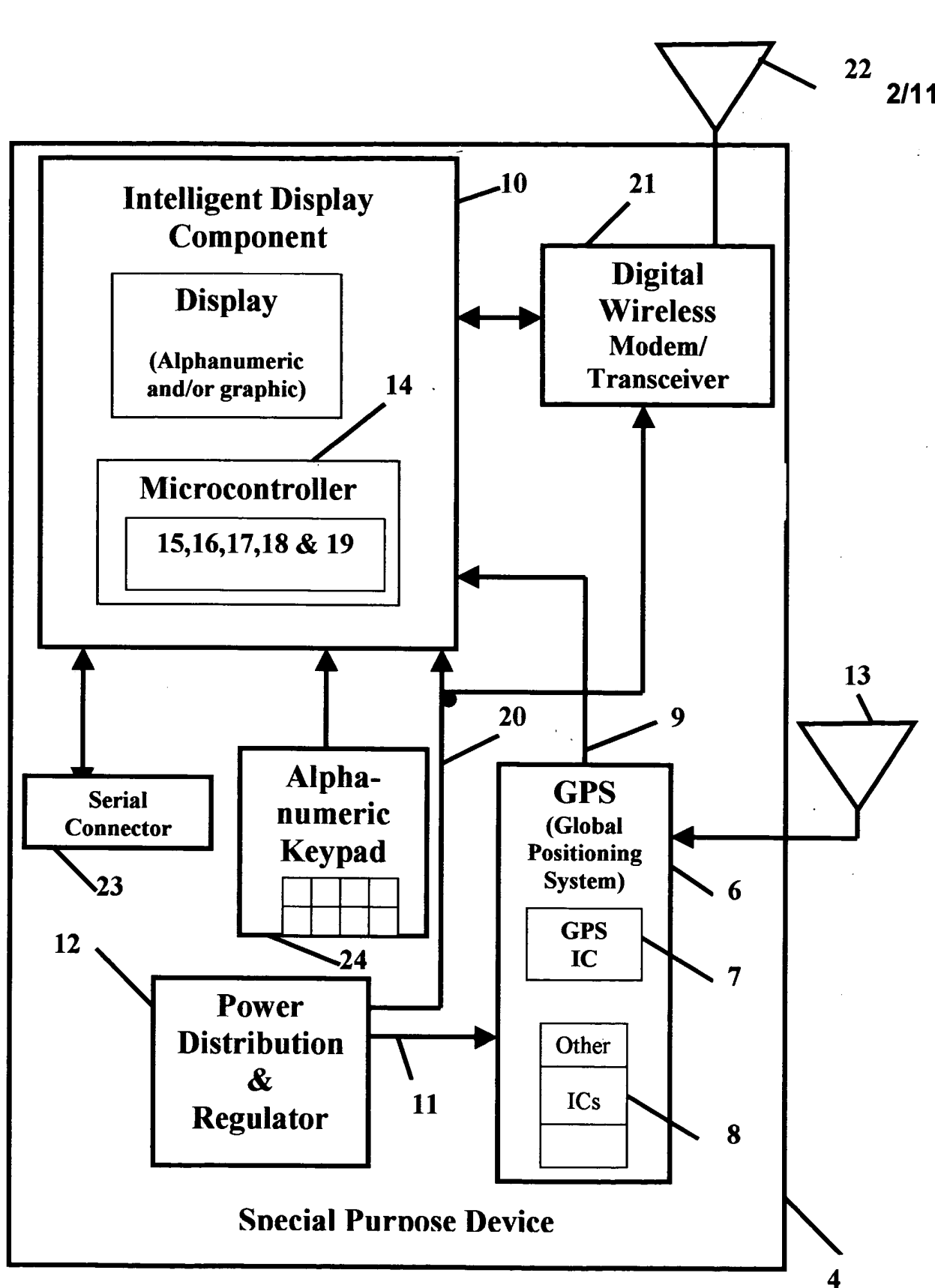
**Fig. 1**



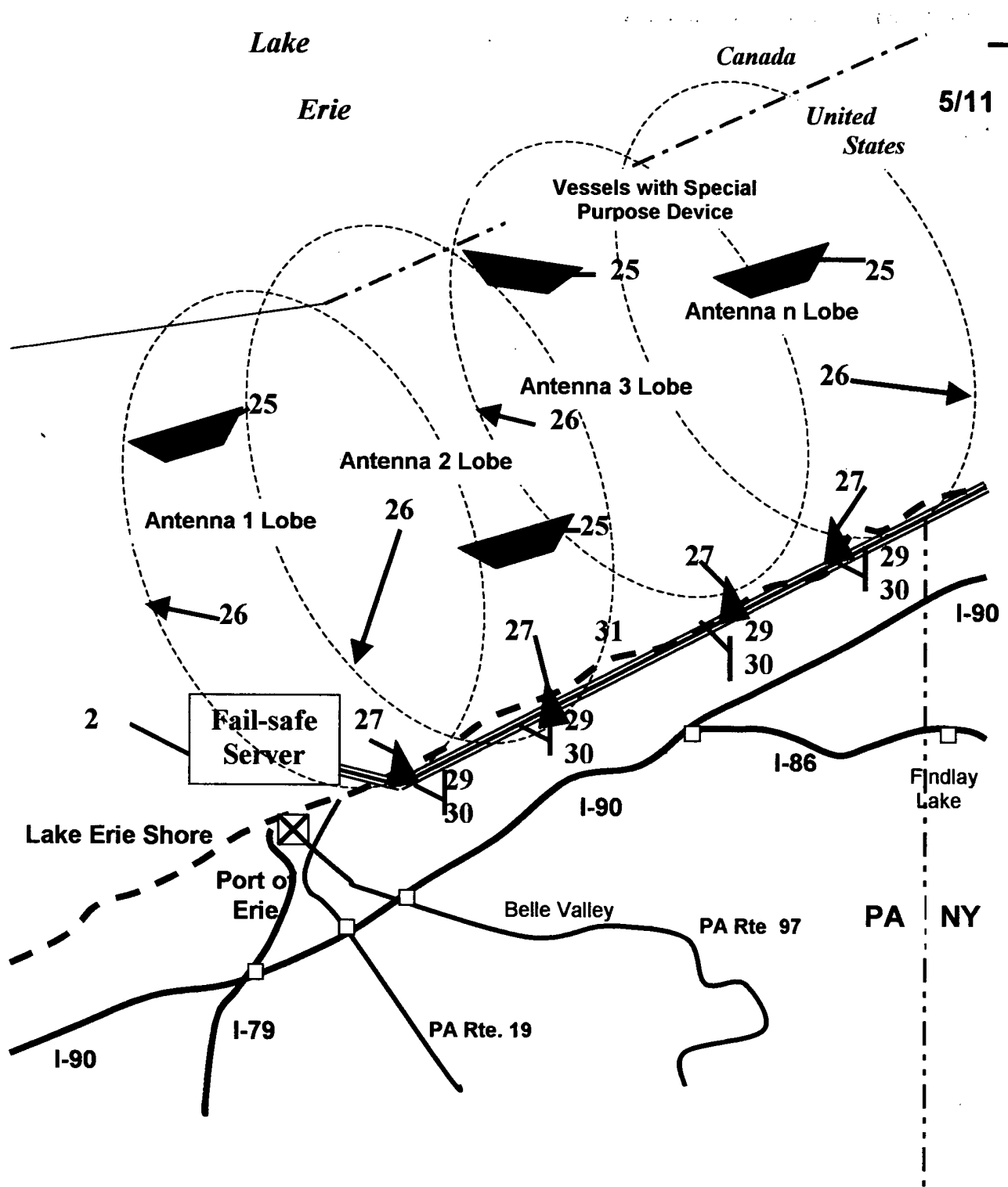
**Fig. 2**

|   |  |                                 |  |
|---|--|---------------------------------|--|
| <b>Mariner Keypad or On-board Sensor Initiated Transmissions</b>                |  |                                 |  |
| <b>Emergency Key (E) with example codes for type of emergency.</b>              |  |                                 |  |
| Transmissions alternatively initiated automatically by sensors noted with "***" |  |                                 |  |
| <b><u>Code</u></b>  |  | <b><u>Condition</u></b>         |  |
| 1   |  | Man Overboard                   |  |
| 2   |  | Engine fire*                    |  |
| 3   |  | Explosion or Collision*         |  |
| 4   |  | Heart failure                   |  |
| 5   |  | Excessive Bleeding              |  |
| 6   |  | Unconscious Passenger           |  |
| 7   |  | Taking on water - high rate*    |  |
| 8   |  | Concussion                      |  |
| 9   |  | Other serious injury            |  |
| 0   |  | Vessel at site of emergency     |  |
| A   |  | Smoke - black*                  |  |
| B   |  | Smoke - blue*                   |  |
| C   |  | Smoke - gray*                   |  |
| D   |  | Lost night lights*              |  |
| *   |  | Excessive Throttle Position     |  |
| E   |  | Suspicious vessel nearby        |  |
| <b>Service Request Key (S) with example codes for type of service.</b>          |  |                                 |  |
| <b><u>Code</u></b>  |  | <b><u>Condition</u></b>         |  |
| 1   |  | Engine stall - need mech or tow |  |
| 2   |  | Out of fuel - gasoline          |  |
| 3   |  | Out of fuel - diesel            |  |
| 4   |  | Run aground - tow               |  |
| 5   |  | Main battery discharged         |  |

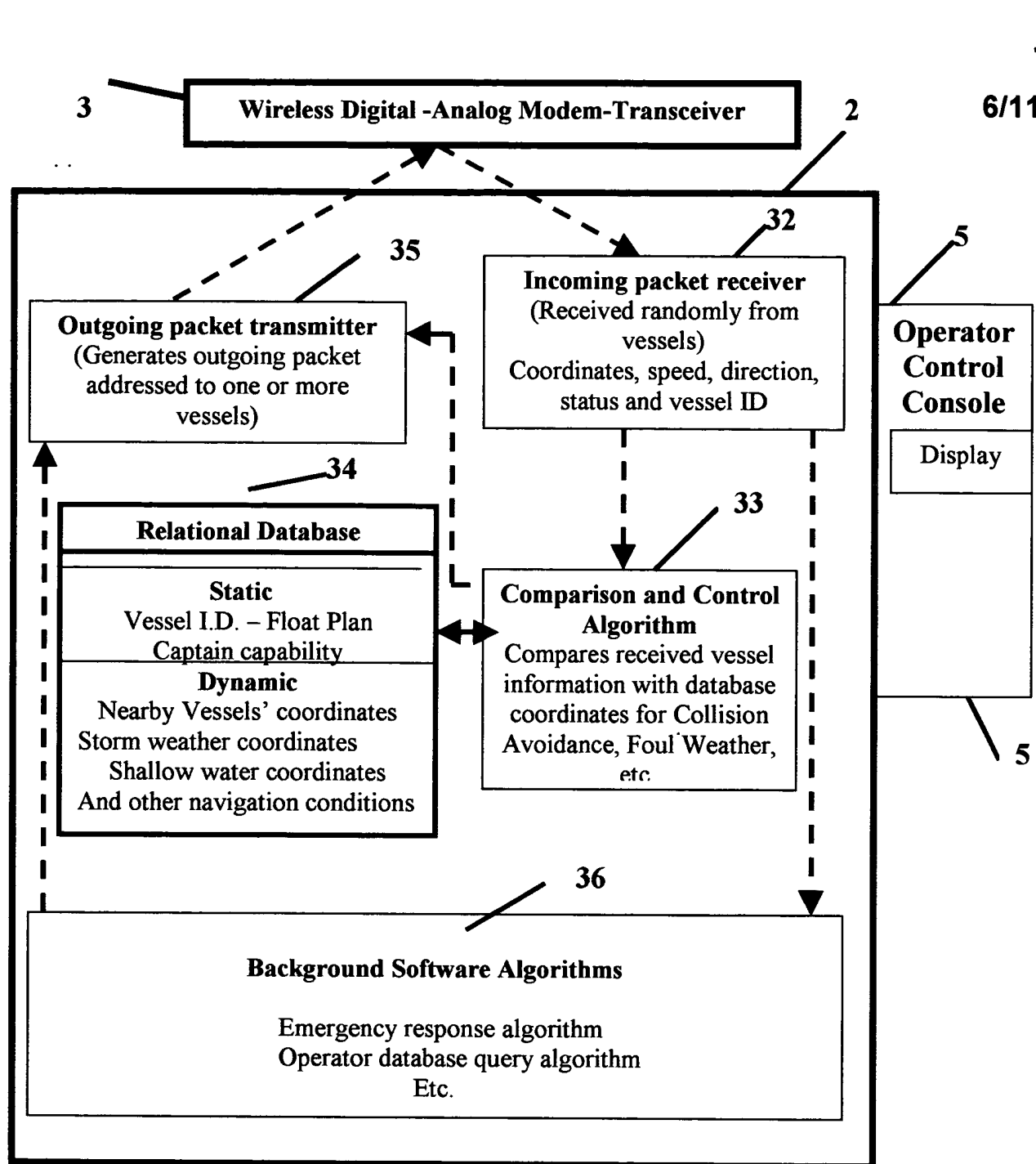
**Fig. 3**

| <u>Mariner Initiated Alphanumeric Keypad Entries</u>             |   |  |
|--|---|--|
| Navigation Information Key (N) with example codes for operation. |   |  |
| <u>Code</u>  | <u>Condition</u>  |  |
| 1  | Waypoint modification<br>Float plan (No. and expected t)          |  |
| 2  | Add new waypoint(s)<br>Float plan (No. and expected t)            |  |
| 3  | Anchored position<br>Coord. & expected time                       |  |
| 4  | Weigh anchor<br>Coord. & time                                     |  |
| 5  | Provide safe course waypoints<br>Enter target waypoint            |  |
| Mariner Database Query Key (D) with example codes for operation. |   |  |
| <u>Code</u>  | <u>Condition</u>  |  |
| 1  | List nearby vessels<br><i>Miles radius, ID, type, captain</i>     |  |
| 2  | List nearby on-shore Nav aids<br><i>Coord - type of signals</i>   |  |
| 3  | List nearby off-shore Nav aids<br><i>Coord - type of signals</i>  |  |
| 4  | List nearby landmarks<br><i>Miles rad type, signals day/night</i> |  |
| 5  | List nearby underwater hazards<br><i>Miles rad. Coordin type</i>  |  |
| 6  | Provide a transmit check  |  |
| 7  | Provide a depth check   |  |

**Fig. 4**



**Fig. 5**



**Fig. 6**

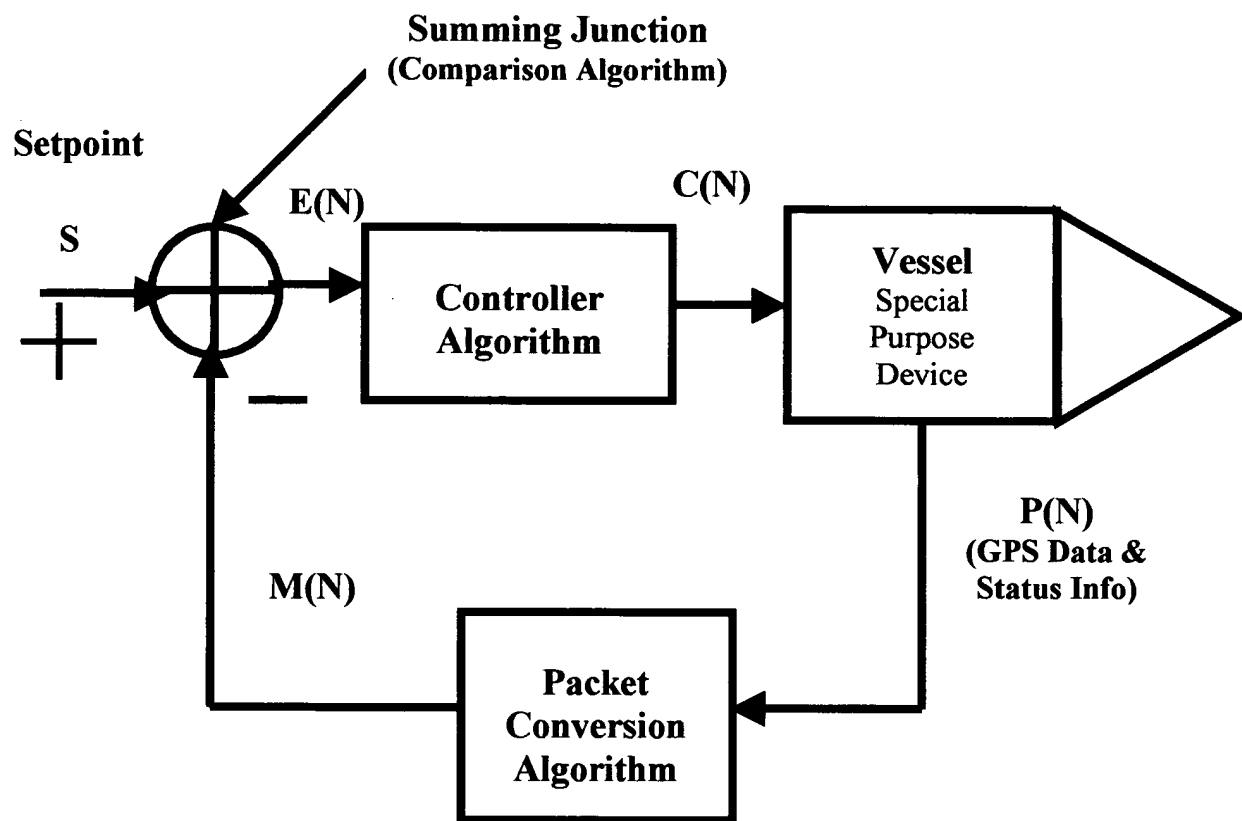
| Per Vessel Table of Static Records in Relational Data Base |                        |                    |                        |                         |
|--|------------------------|--------------------|------------------------|-------------------------|
| <b>Vessel ID No.</b>                                       |                        |                    |                        |                         |
| <b>Owner</b>   | <b>Boat Type</b>       | <b>Boat Color</b>  | <b>Boat Trim</b>       | <b>Boat Name</b>        |
| <b>Registration No.</b>                                    | <b>Length</b>          | <b>Make</b>        | <b>Xtra Field</b>      | <b>Xtra Field</b>       |
| <b>Owner</b>   | <b>Name</b>            | <b>Address</b>     | <b>Phone</b>           | <b>Email</b>            |
| <b>Coowner #2</b>  | <b>Name</b>            | <b>Address</b>     | <b>Phone</b>           | <b>Email</b>            |
| <b>Coowner #2</b>  | <b>Name</b>            | <b>Address</b>     | <b>Phone</b>           | <b>Email</b>            |
| <b>Engine Type</b>   | <b>No. of Engines</b>  | <b>HP each</b>     | <b>Fuel Capacity</b>   | <b>Fuel Type</b>        |
| <b>Survival Equip</b>                                      | <b>PFDs</b>            | <b>Flares</b>      | <b>Mirror</b>          | <b>Dinghy/raft</b>      |
| <b>Smoke signals</b>                                       | <b>Flash/spotlight</b> | <b>Food</b>        | <b>Anchor</b>          | <b>EPIRB</b>            |
| <b>Radio</b>   | <b>Type</b>            | <b># of Freqs.</b> | <b>Radar</b>           | <b>Other</b>            |
| <b>Xtra Field</b>  | <b>Xtra Field</b>      | <b>Xtra Field</b>  | <b>Xtra Field</b>      | <b>Xtra Field</b>       |
| <b>Xtra Field</b>  | <b>Xtra Field</b>      | <b>Xtra Field</b>  | <b>Xtra Field</b>      | <b>Xtra Field</b>       |
| <b>Float Plan No.</b>                                      | <b>Persons Aboard</b>  |                    |                        |                         |
| <b>Pssngr name</b>   | <b>Address</b>         | <b>Phone no.</b>   | <b>Age</b>             | <b>Emerg. Contact</b>   |
| <b>Pssngr name</b>   | <b>Address</b>         | <b>Phone no.</b>   | <b>Age</b>             | <b>Emerg. Contact</b>   |
| <b>Pssngr name</b>   | <b>Address</b>         | <b>Phone no.</b>   | <b>Age</b>             | <b>Emerg. Contact</b>   |
| <b>Pssngr name</b>   | <b>Address</b>         | <b>Phone no.</b>   | <b>Age</b>             | <b>Emerg. Contact</b>   |
| <b>Pssngr name</b>   | <b>Address</b>         | <b>Phone no.</b>   | <b>Age</b>             | <b>Emerg. Contact</b>   |
| <b>Pssngr name</b>   | <b>Address</b>         | <b>Phone no.</b>   | <b>Age</b>             | <b>Emerg. Contact</b>   |
| <b>Pssngr name</b>   | <b>Address</b>         | <b>Phone no.</b>   | <b>Age</b>             | <b>Emerg. Contact</b>   |
| <b>Time Leave at</b>                                       | <b>FROM</b>            | <b>GOING TO</b>    | <b>EXPECT RTN BY</b>   |                         |
| <b>Time at Stop 1</b>                                      | <b>Where</b>           | <b>Going to</b>    | <b>Expect Depart T</b> |                         |
| <b>Time at Stop 2</b>                                      | <b>Where</b>           | <b>Going to</b>    | <b>Expect Depart T</b> |                         |
| <b>Time at Stop 3</b>                                      | <b>Where</b>           | <b>Going to</b>    | <b>Expect Depart T</b> |                         |
| <b>WAYPOINTS FOR TRIP</b>                                  |                        |                    |                        |                         |
| <b>1</b>   | <b>N deg min</b>       | <b>W deg min</b>   | <b>Date/Mil. Time</b>  | <b>X% Course Toler.</b> |
| <b>2</b>   | <b>N deg min</b>       | <b>W deg min</b>   | <b>Date/Mil. Time</b>  | <b>X% Course Toler.</b> |
| <b>3</b>   | <b>N deg min</b>       | <b>W deg min</b>   | <b>Date/Mil. Time</b>  | <b>X% Course Toler.</b> |
| <b>4</b>   | <b>N deg min</b>       | <b>W deg min</b>   | <b>Date/Mil. Time</b>  | <b>X% Course Toler.</b> |
| <b>5</b>   | <b>N deg min</b>       | <b>W deg min</b>   | <b>Date/Mil. Time</b>  | <b>X% Course Toler.</b> |
| <b>6</b>   | <b>N deg min</b>       | <b>W deg min</b>   | <b>Date/Mil. Time</b>  | <b>X% Course Toler.</b> |
| <b>7</b>   | <b>N deg min</b>       | <b>W deg min</b>   | <b>Date/Mil. Time</b>  | <b>X% Course Toler.</b> |
|  |                        |                    |                        |                         |
|  |                        |                    |                        |                         |

Fig. 7

|   |                  |                   |                   |         |            |            |
|---|------------------|-------------------|-------------------|---------|------------|------------|
| <b>Table of Dynamic Records in Relational Data Base</b> |                  |                   |                   |         |            |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| Vessel ID No.   | Captain          | N dms             | W dms             | Heading | Spd -knots |            |
| dms = degrees/minutes/seconds                           |                  |                   |                   |         |            |            |
| Front End Point 1                                       |                  | Front End Point 2 |                   |         |            |            |
| STORM 1   | N dms            | W dms             | N dms             | W dms   | Heading    | Spd -knots |
| STORM 2   | N dms            | W dms             | N dms             | W dms   | Heading    | Spd -knots |
| STORM 3   | N dms            | W dms             | N dms             | W dms   | Heading    | Spd -knots |
| FOG 1   | N dms            | W dms             | N dms             | W dms   | Heading    | Spd -knots |
| FOG 2   | N dms            | W dms             | N dms             | W dms   | Heading    | Spd -knots |
| FOG 3   | N dms            | W dms             | N dms             | W dms   | Heading    | Spd -knots |
| WATERSPOUT 1  | N dms            | W dms             | N dms             | W dms   | Heading    | Spd -knots |
| Front End Point 1                                       |                  | Front End Point 2 |                   |         |            |            |
| 4 TO 10 WAVES   | N dms            | W dms             | N dms             | W dms   |            |            |
| AREA  | Rear End Point 3 |                   | Front End Point 4 |         |            |            |
|   | N dms            | W dms             | N dms             | W dms   |            |            |
| dms = degrees/minutes/seconds                           |                  |                   |                   |         |            |            |

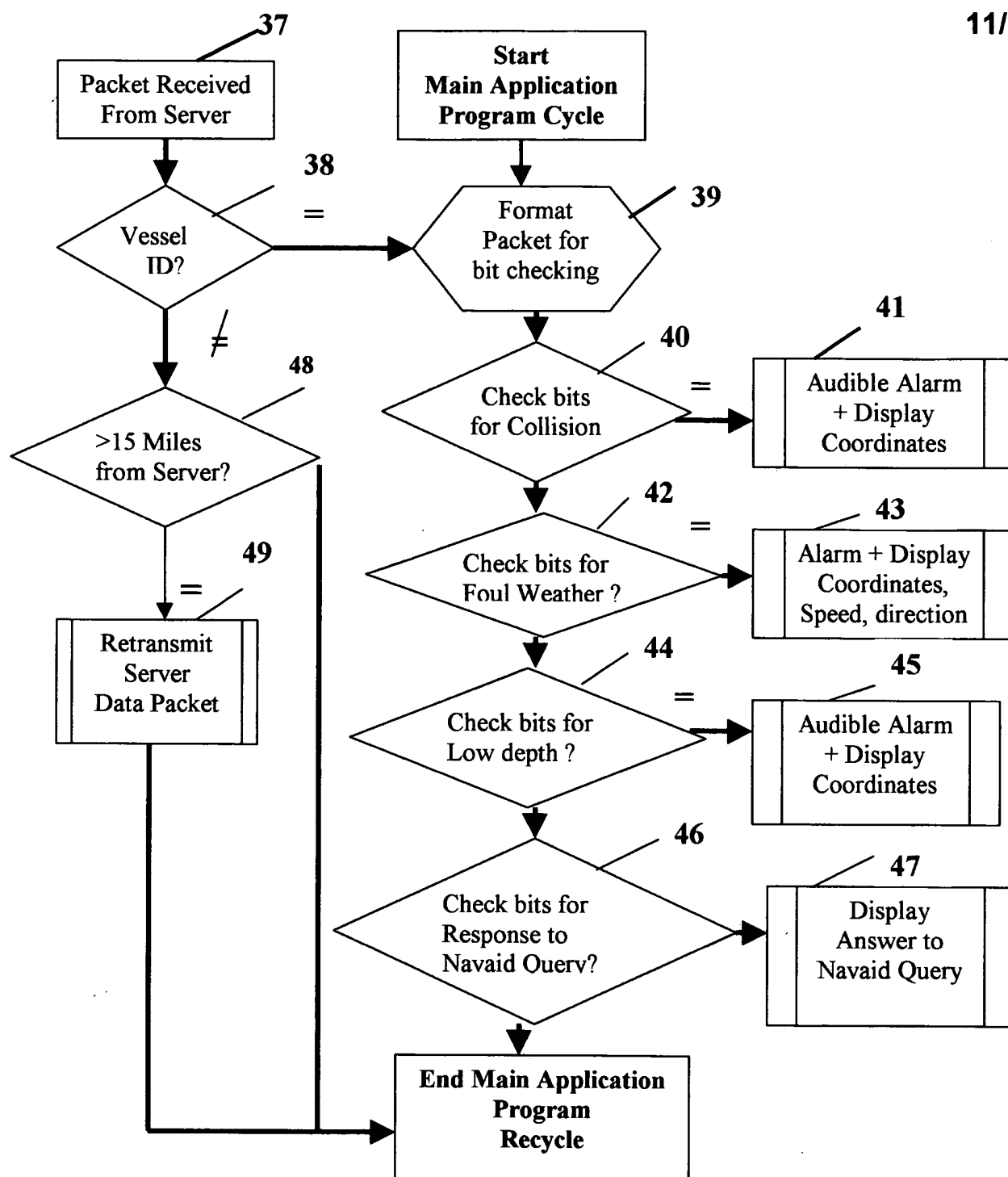
Fig. 8



**Fig. 9**

| Threat List vs. Setpoint and Origin |   |                                      |
|-------------------------------------|---|--------------------------------------|
|                                     |   |                                      |
|                                     |   |                                      |
| <b><u>Function</u></b>              | <b><u>Origin</u></b>                    | <b><u>Setpoint</u></b>               |
| Tracking                            | GPS (subject vessel)                    |                                      |
| Radar Equivalent                    | GPS (vessels near subject vessel)       |                                      |
|                                     |   |                                      |
| <b><u>Threat</u></b>                | <b><u>Origin</u></b>                    | <b><u>Setpoint</u></b>               |
|                                     |   |                                      |
| Off Course - Float Plan             | Float Plan - Manual Entry               | Waypoint (no.,time) envelope         |
| Collision                           | GPS data (threatening vessel)           | GPS data (threatening vessel)        |
| Restricted Area                     | GPS data (perimeter endpoints)          | Waypoint envelope                    |
| USN Ship Restriction                | GPS data (USN Ship)                     | Dynamic Waypoint Envelope            |
| Severe Storm                        | NOAA- time-lapse Doppler (Internet)     | Storm front width, heading and speed |
| High Waves/Wind                     | NOAA buoys/Internet                     | Waypoint Defined Area                |
| High Wind                           | NOAA time-lapse Climatic map (Internet) | Waypoint Defined Area                |
| Underwater Obstruction              | Charts & Manual Region Update           | Waypoint Perimeter                   |
| Surface Obstruction                 | Charts & Manual Region Update           | Waypoint Perimeter                   |
| Fog                                 | Manual sighting (etc.)                  | Waypoint Perimeter                   |
|                                     |   |                                      |
|                                     |   |                                      |
|                                     |   |                                      |
|                                     |   |                                      |
|                                     |   |                                      |
|                                     |   |                                      |

**Fig. 10**

**Fig. 11**

# Figure Reference Number vs. Part Name

System and Apparatus for Automatic and Continuous Monitoring, Proactive Warning and Control of One or More Independently Operated Vessels

Inventor: C. David Rogers

| Fig. | No. | Part Name  |
|------|-----|--|
| 1    | 1   | Not Used   |
|      | 2   | Fail-safe server                                       |
|      | 3   | Wireless/ Analog Modem Transceiver                     |
|      | 4   | Special Purpose Device (GPS/etc.)                      |
| 2    | 5   | Sys Admin/Operator Console                             |
|      | 6   | GPS Printed Circuit Board (PCB)                        |
|      | 7   | GPS Integrated Circuit                                 |
|      | 8   | Other GPS Integrated Circuits (Ics)                    |
|      | 9   | GPS PCB - Intelligent Display connection               |
|      | 10  | Intelligent Display Component                          |
|      | 11  | GPS - Power Connection                                 |
|      | 12  | Power Distribution & Regulator                         |
|      | 13  | GPS antenna  |
|      | 14  | Microcontroller  |
|      | 15  | Microcontroller component - Microprocessor             |
|      | 16  | Microcontroller component - EEPROM                     |
|      | 17  | Microcontroller component - ROM Memory                 |
|      | 18  | Microcontroller component - Flash EPROM                |
|      | 19  | Microcontroller component - RAM                        |
|      | 20  | Power connection Intelligent Display/modem             |
|      | 21  | Digital Wireless Modem/Transceiver                     |
|      | 22  | Wireless Modem/Transceiver Antenna                     |
|      | 23  | Special Purpose Device Serial Connection               |
| 5    | 24  | Mariner Alphanumeric Keypad                            |
|      | 25  | Marine Vessels in Lake Erie                            |
|      | 26  | Wireless Communications Energy Lobes                   |
|      | 27  | Wireless Communications Antennas                       |
|      | 28  | Not Used   |
|      | 29  | Digital Wireless Access Points                         |
| 6    | 30  | Digital Wireless Re-transmitter/receivers              |
|      | 31  | Leased Land Line Communications (ex. Fiber)            |
|      | 32  | Packet receiver algorithm                              |
|      | 33  | Comparison and control algorithm                       |
|      | 34  | Oracle relational data base                            |
|      | 35  | Packet transmitter algorithm                           |
| 11   | 36  | Background software algorithms                         |
|      | 37  | Software buffer - Packets                              |
|      | 38  | Decision element - Vessel ID                           |
|      | 39  | Application software processor - packet formatting     |
|      | 40  | Decision element - collision bit check                 |
|      | 41  | Software subroutine - collision alarm procedure        |
|      | 42  | Decision element - foul weather bit check              |
|      | 43  | Software subroutine - foul weather alarm procedure     |
|      | 44  | Decision element - water depth bit check               |
|      | 45  | Software subroutine - low water depth alarm procedure  |
|      | 46  | Decision element - Operator NAVAID query bit check     |
|      | 47  | Software subroutine - display answer to operator query |
|      | 48  | Decision element - Vessel 20 mile range                |